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## THE SCHOOL OF TO-MORROW.

WE are taught by social and by organic evolution alike that the development both of species and of societies does not always take place at the same rate, but is effected rather by an alternation of periods of stagnation or semi-stagnation during which the evolutive process is very slowly unfolded, with other periods in which the rhythm receives almost unprecedented acceleration. This occurs when the gradual accomplishment of events brings about such a contrast between the being which is evolved and the environment in which it has to live that a new and very rapid adaptation is necessary if an inevitable catastrophe is to be avoided. The nations of Europe, and particularly those of the *Entente*, are passing through such an experience, for, even if they emerge completely victorious from the armed conflict with Germany, they none the less run the danger of collapse in the world-wide economic struggle in the after-war period, if they are not re-organized so as to adapt themselves to that profound and radical change in the environment which has been gradually taking place, and which has arisen from the existence of such a competitor as the German Empire, dominated by its ideal of a hegemony, and in possession of all the psychical, economical and technical elements that are necessary for the accomplishment of its aims.

Renovation, in the case of a nation, does not so much imply a change in the aspect of its external institutions,

as a moral and intellectual re-modeling upon new lines of all those members upon which depend its institutions, its economic life, and its social progress.

This has been instinctively realized by all the nations of the *Entente*, and they have set to work, anxiously, if one may say so,—as if they felt their very existence threatened—to examine their educational systems, and to study those introduced by Germany, in order to discover where their own are defective, and where those of their rival are worthy of imitation.

This examination has merely confirmed the suspicion that no mysterious secret, no wonderful pedagogic discovery is to be found in the German systems, with perhaps a single exception, that they succeed better than ours in providing the community at large (and not a small minority belonging to the higher classes, but the mass of the people) with that valuable body of concrete knowledge, that elasticity of adaptation to the environment, that capacity for transforming the latter into a shape appropriate to its own ends, which in the struggle for existence have always been considered the very certainty of success.

Let us then examine in the first place whether our own systems are the best suited to effect that continual contact with the greatest possible number of different objects or facts in the external world, and to develop the spirit of observation which alone can furnish the child with that vast aggregate of knowledge of its environment which constitutes the basis indispensable both to its adaptation to that environment, and to its ability to effect a further transformation of it in accordance with needs.

For that purpose we have from the earliest awakening of the child a valuable auxiliary in its innate curiosity. The observation of everything that comes before its eyes should not give rise to fatigue, especially if it is made a matter of play by the wise use of its toys. The Germans

in their toys have done wonders in the faithful reproduction in miniature of all that can be reproduced of the external world. They have been no less successful in dealing with the side of that world spontaneously presented to us by nature, and with the technical side gradually brought into being by the industry of man. In every other country this magnificent opportunity has been neglected. We have, indeed, often allowed our toys to give us a false idea of reality. For instance, the little tin engines which delight our children are set going by the winding up of a spring. But the German locomotive has its little boiler, and its little spirit-lamp, and thus the child itself makes the steam, and it is the steam which moves the piston in toy and real machine alike. Thus the child, by that spontaneous curiosity which leads it to endeavor to understand the working of the little mechanism, acquires without an effort something of that mental habit, that instinct of the engineer, which will later stand him in good stead when he enters the technical school or the polytechnic, into which too many of our children are pitchforked without ever having been near a machine. I am not referring to all those wonderful toys which, because they are so cheap, are more and more within the reach not only of the wealthy but of all classes of the community: railway stations, factories, stables, farms, etc., completely fitted up and suitable for giving an exact idea of the agricultural and industrial environment in which the man of the future at a later period will have to exercise his activity, whatever his condition in life may be; kitchens and rooms, all complete and presenting to the child every object required in a well-managed household; Noah's Arks, with faithful reproductions of the various types of animals; miniature botanical gardens with their trees and plants; and so on. Unfortunately we are still very far from this ideal in which the toy is a faithful reproduction in miniature of the external environment, both

natural and technical,—the ideal by which the environment which the child will be called upon some day to dominate and to transform is made part and parcel of its mental furniture.

Our infant and elementary schools are not successful in this exercise of the spirit of observation, and in the bringing of the mind into contact with reality. With those rare exceptions in which the Montessori system has been applied with success, these schools seem to place every imaginable stumbling-block in the way of furnishing the child with the slightest experience of the world and of life. The school itself is too often a bare and empty room, containing nothing but forms and desks. It should be first and foremost a rich and varied museum. The teaching, instead of consisting of lessons on things, is purely verbal. Reading and writing, instead of being taught as a means of acquiring the experience of others, and of communicating to others our own experiences, becomes an end in itself. At far too early a period grammar is made to exercise a wicked strain on the infant intelligence, and checks at its very birth the vital impulse of the child mind—a mind that is eager to know everything. As far as life is concerned, the essential utility of the memory consists in the power it gives of storing up in the mind the recollection of the experiences we have lived through, or the experiences of our fellows. Thus the memory of the child should be exercised by encouraging him to recall and to relate to accurate terms what he has seen and noticed during the past few days. Instead of this, he is wearied out by oral repetition of passages of insipid poetry, exercises in mechanical recitation, which are all the more irksome to the pupil because, wiser than his master, he sees no object in them. And to crown all, there are the essays, in which the poor child has to make bricks without straw. Surely the mere written description, *carefully drawn up in consecutive*

*order*, of concrete objects which have interested him, or may have been placed before him with the purpose of interesting him, would have the twofold effect of exercising his powers of observation, and of training him in that *clear, accurate* and *systematic* expression which is all that should be expected in compositions from children in either elementary or secondary schools.

Drawing from nature and geometrical drawing are either completely neglected or are taught by old and defective methods, in spite of the fact that again and again it has been insisted that they are useful, in the one case as giving a knowledge of the fundamental geometrical properties of objects, and in the other as cultivating the power of observation. The same may be said of manual work, which has rightly been claimed as invaluable in developing the faculty of observation, in bringing to light the fundamental physical properties of matter, and in giving to man that sense of power over matter and the forces of nature which raises him morally and strengthens his will and energy in action.

In all cases the mere knowledge of facts, the mere experience that comes from ourselves or our fellows, is not in itself enough to produce an adaptation to the environment, or, to put it better, to give us the power of adapting the environment to ourselves, our needs and our ends. What really makes us masters of nature is *reason*, because it is only by means of reason that we are able to determine what results will follow this act or that; reason points out to us the path by which the desired result will be achieved; in a word, it is reason that gives us the power to foresee and serves as a guide to all our actions. Now in our schools, and especially in our secondary schools where this faculty should be more particularly cultivated, an infinite number of opportunities of developing it are neglected, and in certain cases one might even assert that the object of

instruction seems rather to destroy than to develop the precious faculty that Mother Nature, wiser than the school, has given us.

It is true that mathematics are excellent as a gymnastic for this faculty of reasoning, but mathematics are not enough. This subject degenerates, especially after the intuitive period of instruction has passed, into a purely mechanical exercise, especially for those pupils who have no genuine aptitude for the subject. Take for example the case of the schoolboy who in his final examination did all his calculations correctly, but was at a loss to explain the tiresome  $\pi$  which came into nearly every formula he used! In any case, as mathematics are usually taught, they develop but one side of the reasoning faculty, the deductive, while they tend rather to dry up the synthetic or intuitive side, by means of which we are able to see analogies between certain phenomena which at the first glance may seem to be quite dissimilar, and thereby to extend to quite a new category of phenomena what we already know from another category which is more familiar to us. Besides, mathematics, either because they are too mechanical, or because of the over-development they produce on the deductive side, tend rather to atrophy what Pascal called *l'esprit de finesse*, which is so necessary to men of business and to men of action in general, and which, thanks to the synthetic view it gives us of a complicated aggregate of circumstances, consists in the faculty of forming for oneself an accurate idea of the relative importance of the different factors or phenomena which combine to produce a whole. Charles Darwin, who himself confessed his aversion from mathematics, shows us nevertheless in his masterly works that he possesses this synthetic faculty, and that in vigor of thought he is inferior to none of the most eminent mathematicians.

The natural sciences could lend themselves wonderfully

to the development of this reasoning faculty, and to its development on the deductive or analytical side as well as on the intuitive or synthetic side. But we know only too well how, with the rarest exceptions, they are taught in most schools. In the first place the greatest care seems to be taken to keep out of sight of the student the objects with which he should be closely familiar. Instead of the objects themselves, he is given long and minute verbal descriptions which cannot give him the least idea of what the objects are. He is compelled to learn by heart that a stork has a long bill and long legs, although he has never seen even a stuffed specimen of that fowl. Time is wasted over classifications and sub-classifications, and woe to the unfortunate examinee who cannot repeat like a parrot the species and the genus of birds to which the stork belongs! This is no exercise for the reasoning powers or for the spirit of observation. And yet, the doctrine of evolution, set forth as the nucleus of all the natural sciences, accompanied by concrete presentation, or by very clear images of the different species and of their environment, would explain the genesis of the most fundamental peculiarities of the structure of animal and vegetable organisms, and would thus keep the reasoning faculty constantly at work. Instead of allowing the instinctive mental inertia of the child full play while he is receiving and storing up in his memory the master's verbal statements as to the morphological characteristics of the different species, the pupil should be steadily induced to find out for himself the why and the wherefore of certain characteristics presented by certain organisms compelled to live and move in a stated environment. He would thus acquire a synthetic vision combined with an intimate knowledge of the organic world about him, and at the same time he would find in his hand the precious thread of Ariadne which will in the future guide him in all the

transformations which he may find it useful or necessary to effect in his zoological or botanical environment.

The branch of the natural sciences which comprises notions of the structure, the functioning, and the physiological and physical hygiene of our organism must in future have a much more important place in our system than it holds at present. Of themselves these ideas would constitute a solid basis for individual positive morality, and from the social point of view would eventually secure to the nation the maximum return from its potential energies, and would in particular prevent the early decadence or premature destruction of those energies.

Geography based on the naming of capes and bays, of latitudes and longitudes, also fails in its object, which should be that of giving to man a knowledge of the physical, economical, and social environment in which it is his lot to live. Nor does it assist the development of the reasoning faculty either on the deductive or on the intuitive side. And yet no other subject can equip the future *homo oeconomicus*, the worker in the fields or in the factories, the clerk or the emigrant, with information more indispensable to the different activities which some day he may be called upon to exercise. Nor is there any other subject of study which can more effectively induce him to compare the civilizations and institutions of other lands with those of his own country, and so give him in his political duties as citizen both inspiration and impulse to the reform and betterment of the social environment of which he forms a part. And finally there is no other science which lends itself more to the development of his reasoning powers. But if this is to be secured the teaching must not be purely informative in character. As Irving Elgard Miller, the well-known American teacher and psychologist, maintains, we must proceed by continual questions, e. g.: Why is the climate of England warmer than that of Labrador? Why

are the countries to the east of the Rocky Mountains arid? Why have the United States spent so much money and energy in cutting through the Isthmus of Panama? What are the conditions which have made New York, Chicago, and St. Louis such important towns?, and so on.

The same may be said of history based on dates, names of kings and battles, and isolated events, all of which teach us nothing of the present moment in history, which alone is of interest to us in completing our knowledge of the environment in which we live. From any one single historical fact of the past, pure and simple, we can draw no conclusion that will throw light on the facts of the present. It has been said that man, with reference to his historical environment, is like a traveler who has lost his way in the forest, and who, while he can see the individual trees, is nevertheless incapable of forming such a general and synthetic view of the forest itself, as alone will enable him to find out unaided the direction he must take. Now history, if taught so as to illustrate in its general lines, and at the same time in its deeply-rooted causes, the complicated development of historical facts, and thereby making possible a comparison of general historical situations in the past with those of a similar generality in the present, would then really fulfil the highly important task of facilitating the adequate and complex comprehension of *our* historical environment which, I again assert, is the only one which concerns us. At the same time such teaching would lead to a better comprehension of the resisting power of certain traditions and the prestige of certain institutions, even after the object of their existence has passed away, and the direction of certain evolutive tendencies, which in their aggregate are so many important factors in the complex play of the social forces which make history. And finally, such teaching no less than the teaching of geography, would lead to the continual exercise of practical reasoning,

and would develop the political sense of the future citizen. Questions and problems such as the following would suffice from this point of view: Why did Richelieu in these circumstances or those act in this way or that? In consequence of what conflict between parties or interests did this or that legislative or constituent assembly arrive at this or that decision? What complex historical situation made Napoleon's *coup-d'état* successful?, and so on.

To geography and history must be added with even wider developments the teaching of economic, juridical and administrative science. Not only will this give information that is essential as to the environment in which man must work, earn his livelihood, assert his rights and develop his activity as a citizen, but it will also, by the very questions that are raised and by his efforts at their solution, lead the student to reflect, and will form in him the habit of that accurate evaluation and appreciation of things which is so important a factor of success in life. The mere setting forth of these subjects, and of law in particular, by showing the student the conditions that are necessary for the maintenance and progress of society, would at the same time be a training in what we may call social hygiene, and therefore in that positive social morality which would be the natural complement of the positive individual morality already based on the hygiene of the organism.

But the development of the reasoning faculty in its two-fold aspect of the analytical and the synthetic is not sufficient. The student must in the first place be supplied with the direct and tangible proof of the great domination over matter and the forces of nature which is furnished by the concrete knowledge of external facts, and by reasoning based on them; and he must further be trained in the unceasing application of that concrete knowledge and in the use of his reasoning faculty in such a way as to become accustomed to making them the infallible guide and cri-

terion of all his actions. This lofty function of education is fulfilled by nothing more effectively than by the teaching of chemistry and physics, throughout accompanied by that work in the laboratory which should be possible in every secondary school. By its direct action on matter and the forces of nature, by the constant overcoming of the difficulties which beset the path of all experiment, and which are overcome by reflection alone, by investigation under the impulse of the eagerness to discover why this or that experimental result is not what was expected—by all these means will the adolescent find that his powers of observation and his reasoning faculty are being refined. At the same time the will and the resolution to attain the desired end will be strengthened, and the result will be to realize in one and the same individual the happy union of the man of action and the man of thought.

If the subjects we have mentioned aim at the intellectual cognitive development properly so called, the teaching of literature must not only develop and enrich the creative fancy of the student, an inestimable possession in all the really new contingencies of life, but it must also have a highly educative end, the endowment of the youthful mind with lofty moral sentiments, sentiments which are as necessary for the well-being as for the progress of the community.

If the objects to be attained by the teaching of literature are those I have indicated, here then is the unquestionable opportunity of banishing the dead languages from our secondary schools, except of course in the case of students who are destined for literature and for the law.

The old question of the utility of the dead languages is not an absolute but a relative question. The question is: Shall they usurp the place of other and more useful subjects? In this form it admits of but one answer. It is idle to assert that Latin and Greek afford an incomparable in-

tellectual gymnastic, for the modern languages and the subjects already dealt with are even better fitted to achieve that end. Nor can it be claimed that the dead languages furnish the young with ideas which are useful in modern life. On the contrary, it has with as much reason been asserted that the study of the classics unfits men for practical life, and detaches them from the prosaic occupations to which they must some day devote themselves. Nor can it fairly be said, since they speak to us from a distant past, that they can inspire us with sentiments in harmony with the tendencies and aspirations of modern times. And finally, a knowledge of the classics can no longer be claimed as the sole means of knowing the masterpieces of antiquity, for as every one knows, most schoolboys never acquire such a knowledge of Latin and Greek as will enable them to taste the beauties of those masterpieces; and if they know them at all, it is by the means of good translations.

If Latin is absolutely essential to the future students of law, and if Latin and Greek are essential, as they undoubtedly are, to the future students of literature (we do not agree that they are necessary to the students of medicine and the natural sciences, in spite of the few Latin and Greek roots in their technical terminology)—they can always be taught in a special section. They must be taken in extra hours, without encroaching on the time required for the other subjects (and if this supplementary work were to prevent a few young folk from taking up the legal profession, there are few who will question the advantage to society). Or again, the time allotted to the practical work of the laboratory may be omitted by the future students of literature and the law, and given to instruction in the classics.

As for instruction in literature, properly so called, i. e., the knowledge and study of the principal literary masterpieces, ancient and modern, of each country in turn, in the

original text or in good translations—its principal object, I repeat, should be the development of the creative faculty of the fancy, bold and unfettered, without which even the most powerful intellect is but a machine, and at the same time to give every young student an ethical preparation for the exigencies of civic life and social progress, to inspire him with lofty civic sentiments and to make him an upright, noble and generous soul. It is precisely with this object in view that we can and should count on the profoundly emotional and irresistibly suggestive influence that no really classic work in literature ever fails to exercise. Thus the time devoted to literature would be for the pupil a period of rest and gracious respite from the continual strain of the powers of observation and reflection he would be compelled to exercise in the other subjects of a scientific character. Literature, and if required, the history of art, would thus really transport the young mind into an atmosphere full of life, full of fancy, of free inspiration, of noble and lofty sentiments; and his impulse toward the pure skies of the ideal would be spontaneous and vigorous in proportion to the mental constraint of the hours devoted to the other subjects.

As for the teaching of philosophy, the present course must be recast completely and with the utmost care. I would go so far as to say with the most anxious care, for, unfortunately, philosophy as it is taught in our schools, with an insidious metaphysics for its basis, a metaphysics more dangerous than if it were openly declared, seems to have the Mephistophelian function of disturbing and obscuring that lucidity of ideas, that reasoning based on sound sense, that upright and healthy judgment which are innate in the normal man. Teaching of the subject could be given, on a reduced scale, in the literature hours, as the history of philosophy, and then only if it is considered good for the development of the fancy of the student to know

something of those nebulous poems in which the great metaphysical constructions of the past consist. As a discipline in itself, the course should be transformed, partly into one of scientific synthesis, and partly into one of the analysis of the human mind and the history of science, so that the student may acquire that wide and general view which makes him conscious of the illimitable power of which the human intellect is capable, provided that it continues to exercise his activity in the direction imposed upon it by its very nature.

But, the benevolent reader will say, all this has been discussed over and over again. That is perfectly true. But many of these questions must be opened up anew, and not only these, but also those of professional training and of higher education upon which I have not here touched. They are questions which must be re-examined with a fresh mind, and in the light of the harvest of facts revealed to us by the great war. Questions once regarded as of merely academic interest, have now become problems of vital importance. Action is necessary on the part of those who realize the terrible dilemma by which we are faced: There must be reform, or we perish. Safety lies alone in continuous, unwearying effort; no detail in the teaching of to-day must be neglected, no fact in the life of the school must escape examination. Every question in connection with the training of the new generations must be re-opened and thoroughly discussed. The real aims of education must be subjected to the closest scrutiny; the courses of the schools must be overhauled from top to bottom. Every change and improvement must be enforced with implacable tenacity and with every ounce of our energy. Not for one moment must we allow ourselves to be checked in the work of reformation by the inertia of institutions that are now out of date, or by the culpable indolence of legislators or bureaucrats.

Only thus shall we achieve our supreme aim: the equipment of the democracies for the bitter life and death struggle, for the task of opening up the road to the complete attainment of their glorious destiny.

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